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Working Party on Automated/Autonomous and Connected Vehicles*

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Item 10 of the provisional agenda
UN Regulation No. 79

Proposal for a Supplement to UN Regulation No. 79 (Steering Equipment)

Submitted by the expert from the United Kingdom of Great Britain and Northern Ireland**

The text reproduced below was prepared by the expert from the United Kingdom of Great Britain and Northern Ireland proposing to introduce provisions in UN Regulation No. 79 (Steering equipment) for the approval of Remote Control Manoeuvring (RCM) systems. The modifications to the existing text of the Regulation are marked in bold.

* Formerly: **Working Party on Brakes and Running Gear (GRRF)**.

** In accordance with ECE/TRANS/274, para 52), with ECE/TRANS/WP.29/1139, para. 33 and with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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I. Proposal

Insert a new paragraph 2.3.4.4., to read:

"2.3.4.4. "*Remote Control Manoeuvring (RCM)*" means a function actuated by the driver that provides direct control on steering angle, acceleration, and deceleration for low speed manoeuvring. The actuation is made by remote control in close proximity to the vehicle."

Insert a new paragraph 2.3.4.18., to read:

"2.3.4.18. "*Specified maximum RCM operating range (S_{RCMmax})*" means the maximum distance between the nearest point of the motor vehicle and the remote-control device up to which RCM is designed to operate."

Insert a new paragraph 5.6.5., to read:

"5.6.5. Vehicles of category M_1G, N_1G, [N_2 with a maximum laden mass over 7,500kg], and N_3 may be equipped with RCM provided the system fulfils the following requirements:

5.6.5.1. The system shall be active only after a deliberate action of the driver and if the conditions for operation of the system are fulfilled (all associated functions – e.g. brakes, accelerator, steering, camera/radar/lidar are working properly).

5.6.5.2. A continuous actuation of a dedicated button/switch on the remote control device by the driver is required during the manoeuvre. Another button/switch on the remote control device may be used to control the manoeuvring of the vehicle.

5.6.5.3. Whenever the system becomes operational, this shall be indicated to the driver by an optical signal at least at the remote control device.

5.6.5.4. The system shall only operate until 5 km/h (+1 km/h tolerance).

5.6.5.5. At any time during a manoeuvre that the vehicle becomes stationary, the RCM function shall prevent the vehicle from rolling away.

5.6.5.6. If the continuous actuation is interrupted or the distance between vehicle and remote control device exceeds the specified maximum RCM operating range (S_{RCMmax}) or the signal between remote control and vehicle is lost, the vehicle shall stop immediately.

5.6.5.7. The specified maximum RCM operating range shall not exceed [6m] for vehicles of category M_1G and N_1G. For all other vehicles equipped with RCM, the maximum RCM operating range shall not exceed [15m].

5.6.5.8. The system shall be able to be deactivated by the driver at any time.

5.6.5.9. If a door or trunk of the vehicle is opened during the manoeuvre, the vehicle shall stop immediately and the RCM function shall be deactivated.

5.6.5.10. The system shall be designed to be protected against unauthorized activation or operation of the RCM systems and interventions into the system.

5.6.5.11. System information data

5.6.5.12. The Following data shall be provided together with the documentation package required in Annex 6 of this Regulation to the Technical Service at the time of type approval:

5.6.5.12.1. **The value for the specified maximum RCM operating range (S_{RCMmax});**

5.6.5.12.2. **The conditions under which the system can be activated, i.e. when the conditions for operation of the system are fulfilled;**

5.6.5.12.3. **For RCM systems, the Manufacturer shall provide the technical authorities with an explanation of how the system is protected against unauthorized activation.**

5.6.5.13. **For vehicles of Category M_1G and N_1G equipped with RCM, the following requirements shall also apply:**

5.6.5.13.1. **The RCM system shall be so designed that its activation can only be achieved provided the vehicle is not in any of the following locations:**

(a) **A public road/highway;**

(b) **A public car park;**

(c) **An area designated exclusively for use by pedestrians and/or pedal cyclists.**

The system shall be capable of confirming that the vehicle is not located in any of the above locations whilst the RCM function is active and this shall be achieved by at least two independent technical means[1]. If navigation maps are used for this purpose, the RCM function shall be disabled if the map data has not been updated in the previous 12 months.

5.6.5.13.2. **The vehicle shall be equipped with a means to detect an obstacle (e.g. vehicles, pedestrian) in the manoeuvring area and to bring the vehicle immediately to a stop to avoid a collision.**

5.6.5.13.3. **If the vehicle stops having detected an obstacle in the manoeuvring area, subsequent operation shall only be possible following confirmation from the driver. The vehicle shall respond to any subsequent objects detected in the manoeuvring area as prescribed in paragraph 5.6.5.13.2.**

5.6.5.13.4. **It shall only be possible to operate the system when drive is provided to at least one front axle and one rear axle simultaneously.**

5.6.5.13.5. **The vehicle shall detect if, while the RCM function is active, the vehicle enters any of the locations listed under paragraph 5.6.5.13.1. In such a case, the vehicle shall stop immediately and the RCM function shall be deactivated.**

5.6.5.13.6. **The system shall only operate for a maximum total distance travelled of 100m. This distance may be reset if there is no input on the remote control device for at least 1 minute or if the system has been deactivated and a time period of at least 1 minute has elapsed. The distance shall be subsequently measured from the next point at which the RCM function is operated.**

5.6.5.13.7. **The driver shall be issued with a warning signal when the total distance travelled is 75m (+5m tolerance). This shall be fulfilled by the provision of an optical warning signal and either a haptic or acoustic warning signal at least at the remote control device.**

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[1] Two different types of map (e.g. navigation and topographical) supplied by two different suppliers are satisfactory for this requirement.

5.6.5.13.8. If the vehicle reaches or exceeds the maximum total distance travelled defined in paragraph 5.6.5.13.6., the vehicle shall stop immediately and the RCM function shall be deactivated. It shall not be possible to subsequently activate the RCM until a time period of at least 1 minute has elapsed. This shall be indicated to the driver at least at the remote control device."

II. Justification

1. Category G vehicles (defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3)) have specific characteristics that enable them to achieve traction on, and to traverse over, off-road terrain that would defeat and/or damage conventional road vehicles. The operation of vehicles under these conditions requires the driver to have a particular skill level beyond that of the conventional vehicle user. However, despite those skills, in some cases, situations present themselves for which it would be safer for the driver to be able to manoeuvre the vehicle from outside.

2. In addition, there are a number of commercial vehicle applications where it would be safer for the operator to remotely manoeuvre the vehicle from outside (e.g. asphalt spreading). In these scenarios, it is the responsibility of the professionally trained driver to check the area prior to using the system. Nevertheless, the requirements proposed here ensure a minimum level of safety whilst also aiming to harmonise systems coming to market.

3. This proposal seeks to permit remote manoeuvring capability for both commercial vehicles and vehicles designed to operate in an off-road location as confirmed throughout the whole period that the function is in use. For off-road vehicles, the use of the RCM function in any other environment must be suppressed by technical means that cannot be overridden by the vehicle user. The proposal is deliberately non-prescriptive about how the off-road environment is identified but if map data is used then an up to date map is required to ensure that the function does not become available on newly constructed roads, i.e. roads built on land formerly identified as off-road by mapping data.